FLINN SCIENTIFIC

Name_____

Counting Crossing Over Worksheet

Data Table

Genotype	Tally Marks	Total
Non-crossover Asci		
4b:4t		
4t:4b		
Crossover Asci		
2b:2t:2b:2t		
2t:2b:2t:2b		
2b:4t:2b		
2t:4b:2t		

Post-Lab Questions and Calculations

1. Take the sum of the tally marks for each genotype. Record each result in the *Total* column.
2. Determine the total number of noncrossover asci counted.
3. Determine the total number of crossover asci counted.
4. Determine the total number of hybrid asci counted.
5. Determine the map distance between the gene for spore color and the centromere using Equation 1. Report the result in map units. However, keep in mind that each ascus contains 8 spores because the four haploid spores underwent an additional mitotic event after meiosis. To account for this, the map distance found in Equation 1 needs to be halved (Equation 2).

$$\text{Map distance} = \frac{\text{corrected number of crossover asci}}{\text{corrected total number of asci counted}} \times 100 \qquad \textit{Equation 1}$$

$$\frac{\text{Map distance}}{2} \qquad \textit{Equation 2}$$

6. Was the number of each type of crossover phenotype observed relatively constant or equal? Explain why you would expect these numbers to be constant.

7. A similar technique can be used to determine the distance between two genes on a single chromosome. In this laboratory a color mutation was used as the gene of interest. What is the benefit for using a color mutant gene for learning about map units.